DOCUMENT RESUME

ED 199 064 SE 034 289

TITLE Survey of Science Graduates from Nedlands College. Report on Survey of Diploma of Teaching Graduates in Science from the N.C.A.E. Who Are In Their First Year of Teaching (1978). Report Number 2.

INSTITUTION Nedlands Coll. of Advanced Education (Australia).

PUB DATE Apr 79

NOTE 35p.; Page 4 of Appendix A missing. Appendix A marginally legible.

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS Educational Needs; Evaluation Methods; Interviews; *Preservice Teacher Education; *Questionnaires; Science Education; *Science Teachers; *Surveys; Teacher Education; Teacher Education Programs; *Teacher Effectiveness; Teaching Experience

ABSTRACT

Presented are results of a survey to determine the extent to which the needs of first-year science teachers have been met by their preservice program. Responses to questionnaire items were obtained during interviews with individual teachers at their schools. Data gathered from these responses were used to formulate recommendations related to the objectives of the survey, including: (1) identifying possible changes in the overall structure of the diploma of teaching (science); (2) specifying possible changes in the structure of the science component of the diploma of teaching (science); (3) outlining possible changes in the content of specific science units; and (4) evaluating teacher education courses. Also included are subjective impressions noted during the evaluation procedures which may provide worthwhile guidelines for the strategic approach of departmental lectures. (Author/SK)

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REPORT NUMBER 2
DATE: April 79

SURVEY OF SCIENCE GRADUATES From NEDLANDS COLLEGE

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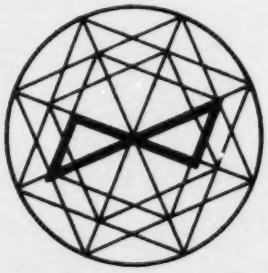

RESEARCH COMMITTEE

SE 034 289

NEDLANDS COLLEGE of Advanced Education

REPORT

ON

SURVEY OF DIPLOMA OF TEACHING GRADUATES IN SCIENCE FROM THE N.C.A.E. WHO ARE IN THEIR FIRST YEAR OF TEACHING (1978).

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Appendix A Survey Questionnaire

1.0 Introduction:

The general purpose of this survey was to determine to what extent the needs of first year science teachers had been met by their pre-service programme, presented as the Diploma of Teaching (Science) at the Nedlands College of Advanced Education. Accordingly, objectives were set up to specify the direction of the investigation, and a questionnaire was constructed to elicit responses about the perceived value of the N.C.A.E. three year course. Approval was obtained from the W.A. Education Department and school principals for interviews to be arranged between the investigator and those teachers whom the N.C.A.E. had identified as "true" Diploma of Teaching (Science) graduates.

During November and December 1978, each teacher was scheduled for an interview during which responses to the questionnaire items were obtained. Fourteen of the sixteen teachers were interviewed in their schools, and two were interviewed at the College. All teachers demonstrated a willingness to be involved in the data gathering procedures, and their cooperation and enthusiasm contributed towards the success of the evaluation.

From the responses to the questionnaire, the data were assembled and presented in a tabular and descriptive format. General trends in the form of patterns of need and expectation were deduced from the results, and used in the formulation of the recommendations. Finally, overall impressions of the survey experience, as perceived by the investigator, were noted.

2.0 Evaluation Objectives:

The general aim of the survey was to determine the extent to which the needs of first year science teachers have been met by their pre-service programme. The Diploma of Teaching (Science) programme had been devised using historical and experiential models which were later modified and compromised by the institutional constraints and personal beliefs. Therefore, specifically the survey attempted to :

2.1 Identify possible changes to the overall structure of the Diploma of Teaching (Science).

2.2 Specify possible changes to the structure of the science component of the Diploma of Teaching (Science).

2.3 Outline possible changes to the content of specific science units.

2.4 Provide a pilot study to examine effective procedures required for course evaluation.

..2

3.0 Data Collection and Target Population:

The data were obtained from the responses of sixteen 1977 sciences graduates of the Diploma of Teaching from the Nedlands College of Advanced Education, to a structured questionnaire designed by Mr. R. McKenzie in consultation with F. Dymond and M. Hackling. The data gathering procedures adopted personal interview techniques in the administration of the questionnaire, which was carried out during November and December, 1978.

3.1 Target Population and its Teaching Commitment

The sample comprised sixteen teachers, who were completing their first year of teaching in secondary schools in Western Australia. They had been identified as the first "true"[1] graduates from the three-year programme of the Diploma of Teaching in science offered by the Nedlands College of Advanced Education. Of the sixteen teachers selected for the investigation, four were female and twelve were male, and they were located in twelve metropolitan and four country secondary schools. While all of the teachers had studied mathematics as a minor teaching area, four of them had specialised in chemistry, six in physics and six in biology.

An examination of teaching responsibilities in the schools showed that all subjects were teaching in their major teaching field, three had classes within their minor teaching area, and two had teaching duties outside their major and minor fields. The total period allocation per week in the minor teaching area was 36, whereas the total weekly period allocation in areas other than the major and minor fields was three. Across all of the schools the average size of the science teaching staff was eight persons, the most frequent size was ten, and the range of the staff size spread from two to thirteen. In fourteen of the schools senior masters/mistresses were in charge of the science department, but in two of the schools other teachers had been assigned the responsibility. With regard to the type of science courses taught in the lower school, nine schools used the L.S.S. programme, three used a joint programme comprising L.S.S. and A.S.E.P., and four employed a mixed programme adapted from L.S.S., A.S.E.P., and individual teacher preference and innovation.

An inspection of the class, teaching area and level allocation of teaching duties, the details of which are presented in Table 1, showed that the sixteen teachers were responsible for a total of 82 classes. Most teachers each had five classes, while a few had four or six, and one had seven. Lower school science classes accounted for 78% of the total teaching duties, upper school science classes contributed 11% to the total teaching, and lower school maths, upper school maths and other duties provided the remaining 11 per cent. An analysis of the lower school science teaching commitment indicated that 29 per cent of the teaching took place in year eight, 22 per cent in year nine, and 23 per cent in year ten.

1 Two or more years full time with N.C.A.E.

..3

3.1 (Cont'd.)

The investigation by levels taught within lower school science revealed that, in year eight, most teaching was carried out with heterogeneous classes, while in year nine the teaching emphasis was spread across advanced, advanced/intermediate, intermediate, and intermediate/basic groups. In year ten the teaching was concentrated in the intermediate and intermediate/basic classes.

3.2 The Questionnaire:

The questionnaire was designed to record the views held by the members of the target population about the appropriateness of their College courses to the practical teaching situation. Apart from gathering data related to the teachers and their teaching commitment, it contained 45 questions designed to elicit teacher reaction to the value of the N.C.A.E. course in relation to the teaching of lower school science. Within this general framework, groups of items were specifically oriented towards knowledge, equipment and teaching skills, science department philosophy, assessment of the overall science course, evaluation of school practice experience, specialist science teaching areas, assessment of science method units, and perceived status of qualifications. Ample opportunity was provided for the respondent to offer his opinions and comments about any item on the questionnaire. Moreover, respondents were guaranteed that all survey data would be treated confidentially, and anonymity assured.

3.3 Administration of the Questionnaire

The questionnaire was administered to each teacher by the process of personal interview. Fourteen teachers were interviewed at their appointed school, and two were interviewed at the Nedlands College. On the average, the administrative time for the questionnaire was 40 minutes. All respondents demonstrated an interest and willingness to assist and play a constructive part in the critical assessment of the value of the N.C.A.E. teacher education course. Most items were clearly interpreted during the interview; however, items 19, 23 and 51 caused momentary difficulty for a few respondents. These items asked the following questions:

a) With respect to overall science department philosophy, to what extent do you agree with the emphasis on practical teaching method rather than theoretical frameworks?

b) Would you be in favour of a resequencing of the programme?

c) Are there recent developments in the schools for which your course failed to prepare you?

..4

4.0 Results:

The analysis of the data relating to the perceived value of the N.C.A.E. science course is presented in a basic, descriptive format of proportionate numbers and percentages. It is classified into sections corresponding to the grouping of items outlined in 3.2. A copy of the full questionnaire is presented in Appendix A.

4.1 Knowledge, Equipment and Teaching Skills Related to Lower School Classes: (Items 14-16)

Items in this grouping asked the respondents to assess the coverage of knowledge, equipment and teaching skills required in the areas of biology, chemistry, physics, geology and astronomy as they related to the lower secondary school science classes being taught. Table 2 presents the details of the responses, which in this case numbered fifteen as the category did not apply to one teacher solely engaged in the upper school. With regard to biology, nine of the respondents stated that the coverage of knowledge required was fair or better, twelve agreed that the equipment skills were fair, good or excellent, and eleven assessed the teaching skills as fair to excellent. The results for chemistry showed that twelve of the subjects considered the knowledge required to be fair, good or excellent, thirteen stated that the equipment skills were fair or better, and ten agreed that the teaching skills were fair to excellent. In relation to physics, eight of the population rated the knowledge as fair good or excellent, while eleven assessed the equipment skills as fair or better, and seven stated that the teaching skills were fair or better. The results for geology indicated that twelve of the respondents claimed a fair, good or excellent rating for the knowledge required, six assessed the equipment skills as fair or better, and seven thought the teaching skills were fair, good or excellent. With regard to astronomy, fourteen of the subjects considered that the knowledge required was fair to excellent, and nine rated the equipment skills and teaching skills as fair to excellent. The response category "cannot say" attracted a number of replies from subjects who, for various reasons, felt they could not adequately assess the question in any of the other five categories. For example, in some instances respondents had not taught topics in that area, and in other instances they had not been involved in some aspects of a particular science area in the College. Across the five content areas, knowledge required and equipment skills attracted eleven responses apiece, while teaching skills attracted six responses.

4.2 Science Department Philosophy: (Items 17-19)

Within this classification the respondents were asked to consider whether departmental philosophy should emphasise the breadth of science as opposed to depth, the integration of teaching method with content units, and practical teaching methods as opposed to theoretical frameworks. Fourteen of the sixteen subjects agreed that science should emphasise breadth, while all agreed that teaching method should be integrated with content units, and that the emphasis on practical teaching methods was preferable to theoretical frameworks.

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TABLE 1

SUMMARY OF TEACHING DUTIES

RESPONDENTS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOTAL
Science Yr.8 Adv.			2	1						1						1	5
Int.				1													1
Basic					1		1			1							3
Hetero	3	2				1		3	1		1		1	1	2		15
Science Yr.9 Adv.		X 1				1			1	X 1	1					X 1	3 X 3
Int.		X 1	2	X 2	2	1	1			X 1				1	2		9 X 4
Basic									1								1
Hetero													1				1
Science Yr.10 Adv.						1								X 1			1 X 1
Int.		1		X 1		1	X 1	X 2	2		1		X		1	1 X 1	7 X 6
Basic			1				1				1			1			4
L.S. Maths	2									1		1	1				4
U.S. Science					2						1	4	1			1	9
U.S. Maths												2					2
OTHER	1									1				1			3
TOTAL	6	5	5	5	5	5	4	5	5	6	5	7	4	5	5	5	82

TABLE 2

ASSESSMENT OF KNOWLEDGE, EQUIPMENT AND TEACHING SKILLS

		Biology		Chemistry		Physics		Geology		Astronomy		Total		
STANDARD	CONTENT	B	P	B	P	B	P	B	P	B	P	B	P	TOTAL
EXCELLENT	Knowledge	2	2	1	3		4		3	1	5	4	17	2_
	Equipment Skills	2	1	1	1		2		1	1	1	4	6	10
	Teaching Skills	3	1						1		2	3	4	7
GOOD	Knowledge	2	3		4		3	2	1	3	1	7	12	19
	Equipment Skills	2	2		5		4	1	1	1	1	4	13	17
	Teaching Skills	2	2	1	2	1	4	1	1	3	3	8	12	20
FAIR	Knowledge			3	1	1		2	4	2	2	8	7	15
	Equipment Skills	1	4	4	2	4	1	1	2	2	3	12	12	24
	Teaching Skills	1	2	1	6		3	2	2		1	4	14	18
POOR	Knowledge	1	1	1		1	1	1				4	2	6
	Equipment Skills		1				1	1	2		1	1	5	6
	Teaching Skills		3	1		3	1	1	3	2	2	7	9	16
VERY POOR	Knowledge		1		1		1						3	3
	Equipment Skills	1	1		1		1	1	1		1	2	5	7
	Teaching Skills		1	1	1		1	1	1	1	1	3	5	8
CANNOT SAY	Knowledge	1	2	1		4		1	1		1	7	4	11
	Equipment Skills			1		2		2	2	2	2	7	4	11
	Teaching Skills			2		2		1	1			5	1	6

N = 15 respondents
B = Biology specialist
P = Physical Scientist specialist

4.2 (Cont'd.)

Fourteen of the sixteen subjects agreed that science should emphasize breadth, while all agreed that teaching method should be integrated with content units, and that the emphasis on practical teaching methods was preferable to theoretical frameworks. In some cases, the agreement was subject to qualification, which generally indicated that, although the choice was desirable, the science department philosophy on occasions did not achieve its aims.

4.3 Assessment of Overall Science Course: (Items 20-27)

In this grouping respondents were asked various questions relating to the time allocation and resequencing of the programme, and the education in the second teaching area. With regard to the relative time spent on educational studies, methodology, content and electives, fourteen subjects registered dissatisfaction claiming, in most cases, that more time should be spent on methodology and content, and less time should be allocated to educational studies and electives. Descriptions for change in these areas centred around three requests:

a) More experience with specific experimentation relevant to the course.

b) Less emphasis on electives with some replacement by science support systems, such as photography.

c) A greater emphasis on content geared to build confidence in the student teacher.

Responses to the item gauging the need to resequence the programme showed that half of the sample considered it already satisfactory, while half thought some resequencing was necessary. The dominant suggestion was to relieve the load in the third year and perhaps build up the commitment in the second year. Subsequent to these respondents completing their Diploma, considerable readjustment in this direction has occurred.

Comments, from three respondents only, on the usefulness of the education in the second teaching area, that is mathematics, indicated generally that it had been moderately useful. However, suggestions were made that the time spent on content, methods and practice had been inadequate. Nevertheless, from the total sample fourteen subjects agreed that mathematics was an essential companion to science.

4.4 Evaluation of School Practice Experience: (Items 28-35)

A number of items in this classification sought responses to the duration, the adequate timing, and the variety of school practice experience, together with an estimate of whether it was sufficiently integrated with the science methodology programme. Ten respondents claimed that the duration of the school practice experience should be increased. Suggestions offered were that:

4.4 (Cont'd.)

a) An additional eight weeks or more were required in the third year.

b) Preferably there should be an eight week session in the second year.

c) There should be a practice, prior to the final practice, that was not assessed, thereby encouraging the use of a wider variety of teaching strategies, teaching skills and associated teaching techniques.

Generally the sample agreed that the school practice experience had been adequately timed. The four respondents who disagreed suggested that the practice should not occur at the beginning or end of an academic year, and that the extended practice in the third year should be at a later time in that year. Regarding the variety of experience offered by the teaching practices, the sample was fairly evenly divided in terms of whether enough had been obtained. Those who claimed insufficient variety suggested that:

a) More practice experience should be available in the second teaching area.

b) Visits to a variety of types of schools to observe and experience alternative procedures could prove helpful.

The integration of school practice experience with the science methodology programme was sufficient for six of the respondents. The remainder suggested that there should be:

a) More support, encouragement and interaction from the N.C.A.E. staff with regard to teaching problems and teaching evaluation.

b) A closer matching of the timing of school practice experience, with specific methodology topics.

c) More cooperation between the school and the college so that the topics taught in the school had already been presented in the teacher education course.

4.5 Specialist Science Teaching Areas: (Items 36-40)

Items were formulated to determine the special science teaching area of each respondent, and to elicit the adequacy of the content received in the non-specialist areas in relation to the lower school science programme. Of the total sample, six were biology specialists and ten specialised in physical sciences. Three of the biology specialists, who felt that they had not received enough physics and chemistry content to cope with the L.S.S., commented that the course should proceed in more detail through the appropriate physics and chemistry sections of the L.S.S. programme. Similarly, the four physical science specialists, who perceived an inadequacy in their biology preparation, suggested a more detailed study of the biology topics in the L.S.S. programme.

4.6 Assessment of Science Method Units: (Items 41-52)

The items in this classification were constructed to measure the effectiveness of aspects of the science method units, and to assess whether the features of curriculum, teaching strategies and assessment in science had proved satisfactory for beginning teachers. Although comments in this section, and sometimes elsewhere in this report, may appear to be contradictory, they simply reflect perceptions and needs of different students. Ten respondents of the total sample considered that certain essential items in the methods units had been neglected, and suggested the following inclusions:

a) Programming of science topics accompanied by formulation of test items, course assessment and the organisation and recording of marks.

b) Increased concentration on experimental demonstrations and familiarity with equipment.

c) Expansion of the L.S.S. experiments to a wide variety of experimentation incorporating common materials found in the home.

d) Specific features of science classroom management particularly safety and first aid.

Eleven subjects stated that items in the science method units were treated too briefly and provided the following suggestions for expansion:

a) Students should know more about different courses such as A.S.E.P.

b) More time needs to be given to teachers' roles in respect to other staff and administrative duties.

c) A greater variety of teaching strategies is required.

d) There is a need to understand the general capabilities of the different levels of students, for example, what is an advanced student?

Of the content of the science method units, eight respondents claimed specific parts to be a waste of time, and accordingly nominated the following:

a) Too much time spent on J.S.S.P., A.S.E.P., I.S.C.S., and so on, without the opportunity to practise these approaches with students.

b) Demonstration teaching.

c) Teaching of the upper school.

d) Philosophy of science teaching.

e) Micro-teaching.

..8

4.6 (Cont'd.)

In response to whether the division of time between upper and lower school curricula had been reasonable, the sample was fairly evenly divided in its yes/no answer. Of those stating "no", half wanted more time on the L.S.S. programme and half wanted extra time on upper school curricula, especially in the areas of experiments, activities and testing. When deciding on the suitability of the relative importance allocated to curriculum, teaching strategies and assessment, again the sample was fairly evenly divided in its response. Those subjects who stated the emphasis was unsuitable wanted more importance placed on teaching strategies and assessment, with particular emphasis given to the construction of test items. Finally, in this section, respondents were asked if they had encountered any recent developments in schools for which their course had failed to prepare them. Six subjects declared this to be so, and outlined the following:

a) Introduction of teachers selecting their own courses.

b) Recent rapid increase in the maturity of students and the consequent disciplinary problems.

c) Upgrading of achievement certificate levels in year eleven, thus offering an alternative upper school system.

d) Extra duties required in district high schools.

e) New chemistry syllabus for years eleven and twelve.

4.7 Perceived Status of Qualifications: (Items 53-57)

In this section of the questionnaire, respondents were invited to register their perceptions of the status of the Diploma of Teaching, and the Bachelor of Education, and to relate it to their job prospects and their needs in future training. Thirteen of the sample rated the status of the Diploma of Teaching as fair or good, and thirteen saw their promotional prospects as fair or better when equipped with the added qualification of the Bachelor of Education. With regard to the prospects of teaching upper school classes, ten subjects thought that this was realistic in the immediate future.

When assessing the value of a Bachelor of Education, fifteen of the respondents favoured a post-experience degree as opposed to a pre-service degree. The response to types of courses and quantity needs in the Bachelor of Education studies showed that, in the region of content, eight subjects required 25 per cent or less, seven required between 25 and 50 per cent, and one required more than 50 per cent. In the area of education studies, seven nominated 25 per cent or less, while seven suggested 25-50 per cent, and two suggested the exclusion of this section. Fourteen respondents wanted 25-50 per cent concentration on science education studies, with two requiring 25 per cent or less, and in the region of electives, seven required 25 per cent or less, one required between 25-50 per cent, and eight wanted the electives removed from the study schedule.

4.8 General Comments:

At the conclusion of the questionnaire, respondents were invited to make any general comments. While a number of responses had already been recorded in previous sections of the questionnaire, and will not be repeated at this point, those enunciated for the first time are presented. They are:

a) A need for greater emphasis on effective disciplinary measures within the classroom.

b) The incorporation of an apprenticeship or internship system in the teacher education programme.

c) A need for lecturers to return to classroom practice for a short period once every five years.

d) All students should have a teaching practice in a "difficult" school.

e) Education units should be placed towards the end of the pre-service course.

f) An optional fourth year of teacher education before teaching.

5.0 Recommendations:

From the results of the data, the use of the questionnaire and the survey procedures, a number of recommendations emerge. These are presented in accordance with the objectives of the survey.

5.1 Changes to the Overall Structure of the Diploma of Teaching (Science):

It is recommended that:

5.1.1 Less time be spent on electives and educational studies, and correspondingly more time be allocated to the methodology and content areas.

5.1.2 Some elective time could be spent more profitably on activity areas having a science orientation, such as

a) Photography
b) Radio and television technology
c) Self-directed research projects
d) Practical and innovative equipment design.

..10

5.1.3 Mathematics, which is perceived as an important companion to science, should be retained as the second (minor) teaching area.

5.1.4 The duration of school practice experience should be increased in the second and third years of the teacher education programme. As well, a greater variety of experience should be provided. For example, students should sample

a) A range of science curricula

b) A range of pupil abilities

c) A range of type of schools

d) A practice in the minor teaching area.

5.1.5 The teaching practices and science methodology programmes be more integrated, so that some of the specific classroom needs and expectations at the various year and ability levels have been anticipated by the methodology.

5.1.6 The Bachelor of Education degree be conceived as a post experience qualification with the structural emphasis on content and science education.

5.2 Changes to the Structure of the Science Component of the Diploma of Teaching (Science):

It is recommended that:

5.2.1 While the knowledge, equipment and teaching skills appear satisfactory, further attention should be given to the teaching skills in a specialist area for the student categorised as a non specialist in that area.

5.2.2 The science department strive to achieve a more effective application of its departmental philosophy which aims to reflect a broad, practical approach emphasising the integration of teaching methods with content units.

5.2.3 The topics of the Lower School Science programme be treated in detail, similar to the presentations required in the classroom, given the variations in years and levels within years.

5.3 Changes to the Content of Specific Science Units:

It is recommended that:

5.3.1 Emphasis be given to the interrelations of topic programming, test item formulation, assessment, and organisation of marks.

..11

5.3 (Cont'd.)

5.3.2 The quantity of experimentation related to particular topics be extended, and adapted to the usage of common materials within the normal home environment.

5.3.3 Alternative courses to the L.S.S. programme be afforded greater familiarity in both the theoretical and practical sense.

5.3.4 In appropriate units, more specific emphasis be given to

a) Features of classroom management

b) Teaching strategies

c) Teachers' roles particularly in relation to other staff and administrative duties.

d) Student abilities and the performance expectations of the so called advanced intermediate and basic student.

5.4 Evaluation of Teacher Education Courses:

On the basis of this pilot study it is recommended that:

5.4.1 The wording of items 19, 23 and 51 be inspected for clarity.

5.4.2 The questionnaire be examined to determine, whether further information is required by departments, and consequently which sections need item addition.

5.4.3 For large target populations precluding the personal interview procedure on the basis of cost and other economic factors, a postal administration be considered. The loss of information which might occur through the lack of cooperation of participants, the misunderstanding of items, collaboration with other similarly identified respondents, and postal discrepancies could be followed up by personal contact and interview. The format of the questionnaire permits the identification of some of the "lost" information. It is anticipated that accurate information would be received from the large majority of respondents.

6.0 Conclusion:

Whereas the survey data formed the basis for this report, a number of general, subjective impressions were noted during the evaluation procedures. Although they are not intended in any sense to be prescriptive, these impressions may provide worthwhile guidelines for the strategic approach of departmental lecturers.

..12

6.0 (Cont'd.)

In relation to the respondents, as beginning teachers, they manifested some confusion about the source of their occupational support systems. Were these to be found at the School or at the College? Also, the beginning teachers tended to perceive the deficits in their content and methodology as the almost exclusive responsibility of others, in the sense that some "others" should provide for all their needs. Generally it seemed that the judgements and evaluations made by the respondents were more closely linked to the educational experience of their third year, than any other year. Notwithstanding this orientation the beginning teachers were well aware that some course problems were as much due to general institutional constraints as any other factors. However they viewed with some concern the lack of transitional internship between their training and their full occupational commitment.

Finally, the writer wishes to commend the cooperation, assistance and support offered by those members of the N.C.A.E. who were involved in the survey. Particularly noteworthy was the occasion during which an interim presentation of the results was discussed. The objectivity of the comments, the insight into students' needs, and the concerned desire to better the programmes manifested by the Science Department staff, were factors of paramount assistance in the compilation of this report. Overall one perceived a sense of respect for the evaluation of the respondents, and a determination to put to good use the acquired information.

June Stephenson
Survey Investigator,
February, 1979.

APPENDIX A

SURVEY QUESTIONNAIRE

NEDLANDS COLLEGE

QUESTIONNAIRE FORM

CONFIDENTIAL

SURVEY OF DIPLOMA OF TEACHING GRADUATES IN SCIENCE

WHO ARE IN THEIR FIRST YEAR OF TEACHING (1978)

RESEARCHER: Explain to respondent that survey is being carried out with approval of The Education Department and his/her Principal. Repeat assurances of confidentiality and anonymity.

Explain that questions are of three kinds:
(1) factual, (2) multiple choice, (3) unstructured or opinion questions.

Respondents are encouraged to give their own comments in answer to all questions, including multiple choice questions.

Explain that, in the case of multiple choice questions, response cards will be displayed in order to minimise statistical bias in responses.

SECTION 1 - BACKGROUND INFORMATION.

1. Respondent's name: MR/MRS/MISS/MS _____

2. School appointment: _____

3. Major teaching field studied: _____

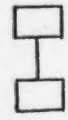
4. Minor teaching field studied: _____

5. Subjects taught and levels at which taught (please sepecify):

SUBJECT	LEVEL

6. Have you been given classes within your major teaching field?

1. Yes
2. No



7. Have you been given classes within your minor teaching field?

1. Yes
2. No

RESEARCHER: If no, go to question number 9.

8. If yes, how many periods per week are you teaching in your minor teaching field?
(please specify): _____

9. Have you been given classes outside your major and minor teaching fields?

1. Yes
2. No

RESEARCHER: If no, go to question number 11.

10. If yes, how many periods per week are you teaching outside both your major and minor teaching fields?
(please specify): _____

11. What is the total number of science teachers in the school including yourself?
(please specify): _____

12. Who is in charge of science teaching in your school?

1. Senior master/mistress ☐
2. Self ☐
3. Other (please specify) ☐

13. What lower school science course is used in your school?

1. L.S.S. only ☐
2. L.S.S. plus A.S.E.P. ☐
3. Other (please specify): ☐

_____

SECTION 2 - PERCEIVED VALUE OF W.A.S.T.C. COURSE

14. For the lower secondary classes you are teaching, how do you assess the college science courses in terms of coverage of the knowledge required?

RESEARCHER: Display prompt card number one.

	Biology	Chemistry	Physics	Geol.	Astron.
1. Excellent	☐	☐	☐	☐	☐
2. Good	☐	☐	☐	☐	☐
3. Fair	☐	☐	☐	☐	☐
4. Poor	☐	☐	☐	☐	☐
5. Very poor	☐	☐	☐	☐	☐
6. Cannot say	☐	☐	☐	☐	☐

15. For the lower secondary classes you are teaching, how do you assess the college science courses in terms of coverage of the equipment skills required?

RESEARCHER: Display prompt card number one.

	Biology	Chemistry	Physics	Geol.	Astron.
1. Excellent					
2. Good					
3. Fair					
4. Poor					
5. Very poor					
6. Cannot say					

16. For the lower secondary classes you are teaching, how do you assess the college science courses in terms of coverage of the teaching skills required?

RESEARCHER: Display prompt card number one.

	Biology	Chemistry	Physics	Geol.	Astron.
1. Excellent					
2. Good					
3. Fair					
4. Poor					
5. Very poor					
6. Cannot say					

17. With respect to overall science department philosophy, to what extent do you agree with the emphasis on breadth of science rather than depth?

RESEARCHER: Display prompt card number two.

1. Agree strongly
2. Agree with qualifications
3. Disagree with qualifications
4. Disagree strongly

18. With respect to overall science department philosophy to what extent do you agree with the integration of teaching method with content units?

RESEARCHER: Display prompt card number two

1. Agree strongly
2. Agree with qualifications
3. Disagree with qualifications
4. Disagree strongly

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RESEARCHER: If no, go to question 24.

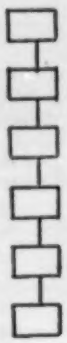
24. If yes, what material should be resequenced, and when? (please specify):

RESEARCHER: If respondent said no to Q7, go to Q27.

25. If yes, how useful is your training in your second teaching area?

RESEARCHER: Display prompt card number four.

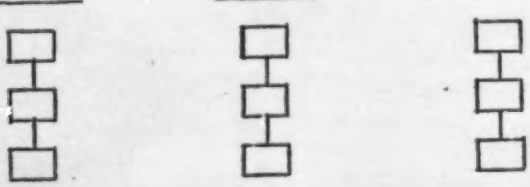
1. Extremely useful
2. Very useful
3. Moderately useful
4. Slightly useful
5. Not at all useful
6. Cannot say



26. In respect of your training in a second teaching area, was the time spent on (a) content, (b) methods and (c) practice adequate or inadequate.

RESEARCHER: Display prompt card number five.

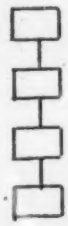
	Content	Methods	Practice
1. Adequate			
2. Inadequate			
3. Cannot say			



27. To what extent do you agree that mathematics is an essential companion subject to science?

RESEARCHER: Display card number two.

1. Agree strongly
2. Agree with qualifications
3. Disagree with qualifications
4. Disagree strongly



28. With respect to the duration of school practice experience should there have been -

RESEARCHER: Display prompt card number three.

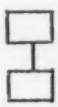
1. More
2. Less
3. No change

RESEARCHER: If "no change", go to question number 30.

29. If change wanted, how much more or less time should have been allocated to school practice experience? (please specify):

30. Was your school practice experience appropriately timed:

1. Yes
2. No



RESEARCHER: If yes, go to question 32.

31. If no, when should school practice experience take place? (please specify):

32. Was your school practice experience sufficiently integrated with the science methodology programme?

1. Yes
2. No

RESEARCHER: If yes, go to question 34.

33. If no, what should occur in order to integrate school practice experience with the science methodology programme? (please specify):

34. Whilst with college, did your practice teaching contain enough variety of experiences?

1. Yes ☐
2. No ☐

RESEARCHER: If yes, go to question 36.

35. If no, how should your school practice experience have been broadened? (please specify):

36. Are you a biology specialist?

1. Yes ☐
2. No ☐

RESEARCHER: If no, go to question 39.

37. If yes, did you receive enough physics and chemistry content to be able to cope with lower school science?

1. Yes ☐
2. No ☐

RESEARCHER: If yes, go to question 41.

38. If no, what suggestions can you make to improve physics and chemistry content for biology specialists? (please specify):

RESEARCHER: For Biology specialists, go to question number 41.

39. If you are a Physical science specialist, did you receive enough biology content to be able to cope with lower school science?

1. Yes ☐
2. No ☐

RESEARCHER: If yes, go to question 41.

40. If no, what suggestions can you make to improve biology content for physical science specialists? (please specify):

41. With respect to the science method units, were any essential items neglected?

1. Yes ☐
2. No ☐

RESEARCHER: If no, go to question 43.

42. If yes, which items were neglected? (please specify):

43. With respect to the science method units, were any items treated too breifly?

1. Yes ☐
2. No ☐

RESEARCHER: If no, go to question 45.

44. If yes, which items were treated too briefly? (please specify):

45. With respect to science method units, do you perceive any items to have been a waste of time?

1. Yes ☐
2. No ☐

RESEARCHER: If no, go to question 47.

46. If yes, which items were a waste of time? (please specify):

47. Was the division of time between upper school and lower school curricula reasonable?

1. Yes ☐
2. No ☐

RESEARCHER: If yes, go to question 49.

48. If no, how should the division of time between upper and lower school curricula be adjusted? (please specify):

49. Was the relative importance given to (a) curriculum, (b) teaching strategies and (c) assessment in science suitable?

1. Yes ☐
2. No ☐

RESEARCHER: If yes, go to question 51.

50. If no, how should the relative importance given to (a) curriculum, (b) teaching strategies and (c) assessment in science be adjusted? (please specify):

51. Are there any recent developments in the schools for which your course failed to prepare you?

1. Yes ☐
2. No ☐

RESEARCHER: If no, go to question 53.

52. If yes, what are the recent developments in schools for which your course failed to prepare you? (Please specify):

53. How do you perceive the present status of the diploma of teaching?

RESEARCHER: Display prompt card number one.

1. Excellent ☐
2. Good ☐
3. Fair ☐
4. Poor ☐
5. Very poor ☐
6. Cannot say ☐

54. How do you perceive your promotional prospects when equipped with the diploma of Teaching and Bachelor of Education Degree?

RESEARCHER: Display prompt card number one.

1. Excellent ☐
2. Good ☐
3. Fair ☐
4. Poor ☐
5. Very poor ☐
6. Cannot say ☐

55. What are your prospects of being assigned to upper school classes?

RESEARCHER: Display prompt card number one.

1. Excellent ☐
2. Good ☐
3. Fair ☐
4. Poor ☐
5. Very poor ☐
6. Cannot say ☐

56. How would you assess the relative value of a post experience Bachelor of Education versus a four-year pre-service Bachelor of Education? (please specify):

57. Can you identify the type of courses that you personally require from Bachelor of Education studies and quantify these needs in percentage terms?

RESEARCHER: Display prompt card number six.

1. Content courses _____ percent
2. Education studies _____ percent
3. Science Education studies _____ percent
4. Other _____ percent

total 100

PLEASE SPECIFY "OTHER":

58. Any general comments respondent wishes to make: